



# Full wwPDB X-ray Structure Validation Report ⓘ

May 23, 2020 – 10:33 pm BST

PDB ID : 5V0X  
Title : Crystal structure of glycylpeptide N-tetradecanoyltransferase from Plasmodium vivax in complex with inhibitor IMP-0001114  
Authors : Seattle Structural Genomics Center for Infectious Disease (SSGCID)  
Deposited on : 2017-02-28  
Resolution : 2.10 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at [validation@mail.wwpdb.org](mailto:validation@mail.wwpdb.org)

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

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The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.11  
buster-report : 1.1.7 (2018)  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.11

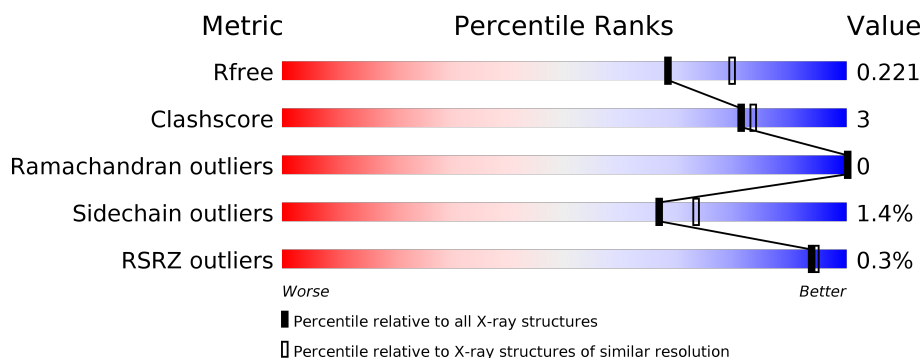
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.10 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
$R_{free}$	130704	5197 (2.10-2.10)
Clashscore	141614	5710 (2.10-2.10)
Ramachandran outliers	138981	5647 (2.10-2.10)
Sidechain outliers	138945	5648 (2.10-2.10)
RSRZ outliers	127900	5083 (2.10-2.10)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions  $\leq 5\%$ . The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	405	 87% 8% 5%
1	B	405	 87% 8% 5%
1	C	405	 85% 7% 8%

## 2 Entry composition

There are 6 unique types of molecules in this entry. The entry contains 10731 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Glycylpeptide N-tetradecanoyltransferase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	385	Total	C	N	O	S	0	2	0
			3158	2051	512	584	11			
1	B	385	Total	C	N	O	S	0	1	0
			3137	2037	510	579	11			
1	C	373	Total	C	N	O	S	0	2	0
			3046	1987	490	559	10			

There are 63 discrepancies between the modelled and reference sequences:

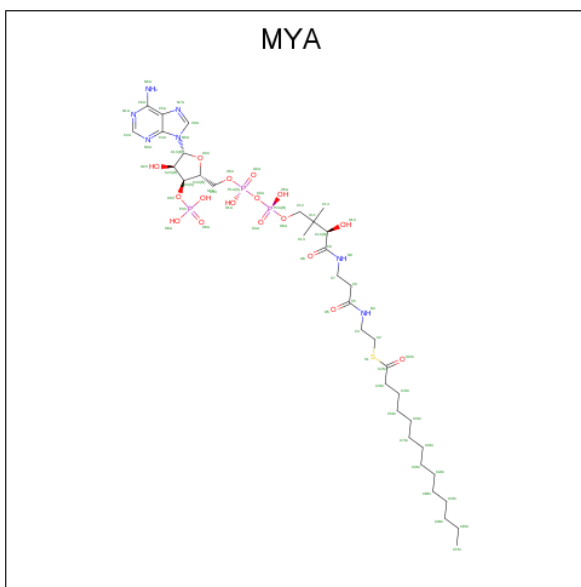
Chain	Residue	Modelled	Actual	Comment	Reference
A	6	MET	-	initiating methionine	UNP A0A1G4HIY1
A	7	GLY	-	expression tag	UNP A0A1G4HIY1
A	8	SER	-	expression tag	UNP A0A1G4HIY1
A	9	SER	-	expression tag	UNP A0A1G4HIY1
A	10	HIS	-	expression tag	UNP A0A1G4HIY1
A	11	HIS	-	expression tag	UNP A0A1G4HIY1
A	12	HIS	-	expression tag	UNP A0A1G4HIY1
A	13	HIS	-	expression tag	UNP A0A1G4HIY1
A	14	HIS	-	expression tag	UNP A0A1G4HIY1
A	15	HIS	-	expression tag	UNP A0A1G4HIY1
A	16	SER	-	expression tag	UNP A0A1G4HIY1
A	17	ALA	-	expression tag	UNP A0A1G4HIY1
A	18	ALA	-	expression tag	UNP A0A1G4HIY1
A	19	LEU	-	expression tag	UNP A0A1G4HIY1
A	20	GLU	-	expression tag	UNP A0A1G4HIY1
A	21	VAL	-	expression tag	UNP A0A1G4HIY1
A	22	LEU	-	expression tag	UNP A0A1G4HIY1
A	23	PHE	-	expression tag	UNP A0A1G4HIY1
A	24	GLN	-	expression tag	UNP A0A1G4HIY1
A	25	GLY	-	expression tag	UNP A0A1G4HIY1
A	26	PRO	-	expression tag	UNP A0A1G4HIY1
B	6	MET	-	initiating methionine	UNP A0A1G4HIY1
B	7	GLY	-	expression tag	UNP A0A1G4HIY1

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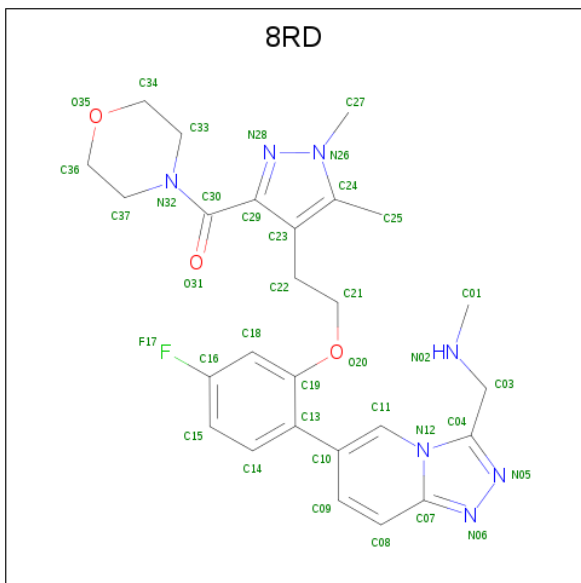
Chain	Residue	Modelled	Actual	Comment	Reference
B	8	SER	-	expression tag	UNP A0A1G4HIY1
B	9	SER	-	expression tag	UNP A0A1G4HIY1
B	10	HIS	-	expression tag	UNP A0A1G4HIY1
B	11	HIS	-	expression tag	UNP A0A1G4HIY1
B	12	HIS	-	expression tag	UNP A0A1G4HIY1
B	13	HIS	-	expression tag	UNP A0A1G4HIY1
B	14	HIS	-	expression tag	UNP A0A1G4HIY1
B	15	HIS	-	expression tag	UNP A0A1G4HIY1
B	16	SER	-	expression tag	UNP A0A1G4HIY1
B	17	ALA	-	expression tag	UNP A0A1G4HIY1
B	18	ALA	-	expression tag	UNP A0A1G4HIY1
B	19	LEU	-	expression tag	UNP A0A1G4HIY1
B	20	GLU	-	expression tag	UNP A0A1G4HIY1
B	21	VAL	-	expression tag	UNP A0A1G4HIY1
B	22	LEU	-	expression tag	UNP A0A1G4HIY1
B	23	PHE	-	expression tag	UNP A0A1G4HIY1
B	24	GLN	-	expression tag	UNP A0A1G4HIY1
B	25	GLY	-	expression tag	UNP A0A1G4HIY1
B	26	PRO	-	expression tag	UNP A0A1G4HIY1
C	6	MET	-	initiating methionine	UNP A0A1G4HIY1
C	7	GLY	-	expression tag	UNP A0A1G4HIY1
C	8	SER	-	expression tag	UNP A0A1G4HIY1
C	9	SER	-	expression tag	UNP A0A1G4HIY1
C	10	HIS	-	expression tag	UNP A0A1G4HIY1
C	11	HIS	-	expression tag	UNP A0A1G4HIY1
C	12	HIS	-	expression tag	UNP A0A1G4HIY1
C	13	HIS	-	expression tag	UNP A0A1G4HIY1
C	14	HIS	-	expression tag	UNP A0A1G4HIY1
C	15	HIS	-	expression tag	UNP A0A1G4HIY1
C	16	SER	-	expression tag	UNP A0A1G4HIY1
C	17	ALA	-	expression tag	UNP A0A1G4HIY1
C	18	ALA	-	expression tag	UNP A0A1G4HIY1
C	19	LEU	-	expression tag	UNP A0A1G4HIY1
C	20	GLU	-	expression tag	UNP A0A1G4HIY1
C	21	VAL	-	expression tag	UNP A0A1G4HIY1
C	22	LEU	-	expression tag	UNP A0A1G4HIY1
C	23	PHE	-	expression tag	UNP A0A1G4HIY1
C	24	GLN	-	expression tag	UNP A0A1G4HIY1
C	25	GLY	-	expression tag	UNP A0A1G4HIY1
C	26	PRO	-	expression tag	UNP A0A1G4HIY1

- Molecule 2 is TETRADECANOYL-COA (three-letter code: MYA) (formula:  $C_{35}H_{62}N_7O_{17}P_3S$ ).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	A	1	Total 63	C 35	N 7	O 17	P 3	S 1	0	0
2	B	1	Total 63	C 35	N 7	O 17	P 3	S 1	0	0
2	C	1	Total 63	C 35	N 7	O 17	P 3	S 1	0	0

- Molecule 3 is {4-[2-(5-fluoro-2-{3-[(methylamino)methyl][1,2,4]triazolo[4,3-a]pyridin-6-yl}phenoxy)ethyl]-1,5-dimethyl-1H-pyrazol-3-yl}(morpholin-4-yl)methanone (three-letter code: 8RD) (formula: C<sub>26</sub>H<sub>30</sub>FN<sub>7</sub>O<sub>3</sub>).

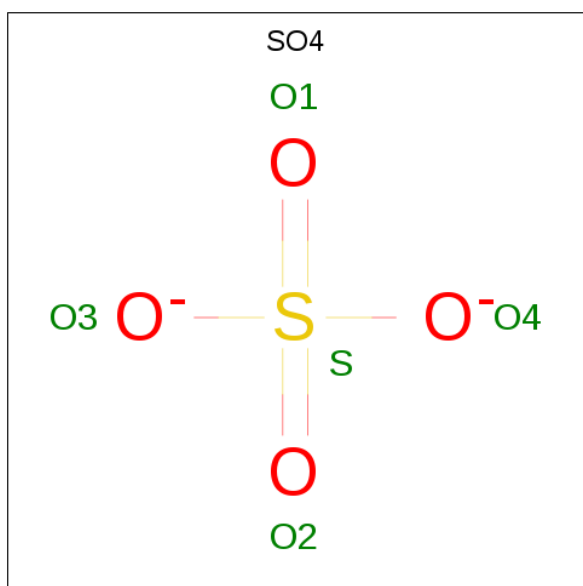


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
3	A	1	Total	C	F	N	O	0	0
			37	26	1	7	3		
3	B	1	Total	C	F	N	O	0	0
			37	26	1	7	3		
3	C	1	Total	C	F	N	O	0	0
			37	26	1	7	3		

- Molecule 4 is CHLORIDE ION (three-letter code: CL) (formula: Cl).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	B	1	Total	Cl	0	0
			1	1		
4	A	1	Total	Cl	0	0
			1	1		
4	C	1	Total	Cl	0	0
			1	1		

- Molecule 5 is SULFATE ION (three-letter code: SO4) (formula: O<sub>4</sub>S).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		

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Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	A	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	B	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		
5	C	1	Total	O	S	0	0
			5	4	1		

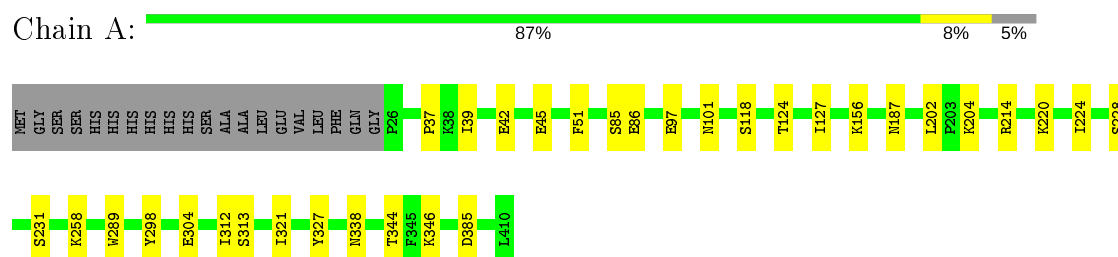
- Molecule 6 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
6	A	361	Total	O	0	5
			366	366		
6	B	315	Total	O	0	3
			318	318		
6	C	315	Total	O	0	3
			318	318		

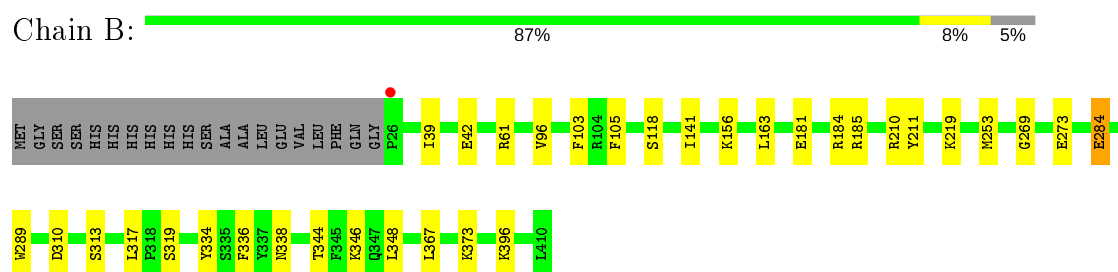
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

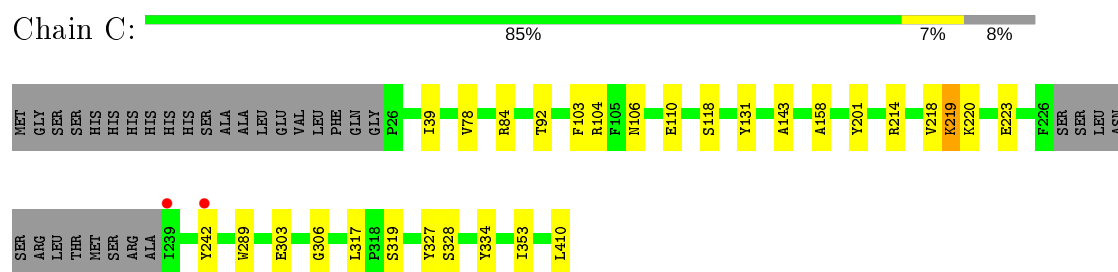
- Molecule 1: Glycylpeptide N-tetradecanoyltransferase



- Molecule 1: Glycylpeptide N-tetradecanoyltransferase



- Molecule 1: Glycylpeptide N-tetradecanoyltransferase





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	57.20Å 118.01Å 173.71Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	48.81 – 2.10 48.81 – 2.10	Depositor EDS
% Data completeness (in resolution range)	99.3 (48.81-2.10) 99.3 (48.81-2.10)	Depositor EDS
$R_{merge}$	0.13	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.58 (at 2.10Å)	Xtriage
Refinement program	PHENIX	Depositor
R, $R_{free}$	0.163 , 0.221 0.163 , 0.221	Depositor DCC
$R_{free}$ test set	1977 reflections (2.86%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	16.8	Xtriage
Anisotropy	0.642	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.36 , 62.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.95	EDS
Total number of atoms	10731	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	19.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.88% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical values of  $\langle |L| \rangle$ ,  $\langle L^2 \rangle$  for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality [i](#)

### 5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: MYA, 8RD, SO4, CL

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	A	0.38	0/3241	0.52	0/4400
1	B	0.38	0/3220	0.53	0/4375
1	C	0.38	0/3132	0.54	0/4257
All	All	0.38	0/9593	0.53	0/13032

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3158	0	3102	17	0
1	B	3137	0	3065	17	0
1	C	3046	0	2961	16	1
2	A	63	0	58	0	0
2	B	63	0	58	1	0
2	C	63	0	58	0	0
3	A	37	0	0	0	0
3	B	37	0	0	0	0
3	C	37	0	0	1	0
4	A	1	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	B	1	0	0	0	0
4	C	1	0	0	0	0
5	A	35	0	0	0	0
5	B	25	0	0	0	0
5	C	25	0	0	0	0
6	A	366	0	0	5	0
6	B	318	0	0	1	0
6	C	318	0	0	2	0
All	All	10731	0	9302	49	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

All (49) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:42:GLU:HG2	1:B:344:THR:HG21	1.70	0.73
1:A:124:THR:O	1:A:127:ILE:HD11	2.03	0.59
1:A:344:THR:HG21	1:B:42:GLU:HB3	1.84	0.58
1:A:312:ILE:HA	1:A:338:ASN:HD22	1.70	0.56
1:C:214:ARG:HG2	1:C:353:ILE:HD13	1.88	0.55
1:B:103:PHE:HB3	1:B:319:SER:HB3	1.87	0.55
1:C:219:LYS:O	1:C:223:GLU:HG3	2.07	0.54
1:C:103:PHE:HB3	1:C:319:SER:HB3	1.90	0.54
1:C:118:SER:HB3	1:C:289:TRP:CZ2	2.43	0.54
1:B:284:GLU:CD	1:B:284:GLU:H	2.10	0.54
1:B:118:SER:HB3	1:B:289:TRP:CZ2	2.46	0.50
2:B:501:MYA:H13B	2:B:501:MYA:HN4	1.76	0.49
1:A:86:GLU:OE2	6:A:601:HOH:O	2.20	0.48
1:B:210:ARG:HH22	1:B:373:LYS:HE2	1.79	0.48
1:A:346:LYS:NZ	6:A:603:HOH:O	2.31	0.47
1:C:218:VAL:HB	1:C:242:TYR:CE2	2.49	0.47
1:A:97:GLU:OE1	1:A:101:ASN:ND2	2.48	0.47
1:A:45:GLU:HB2	6:A:624:HOH:O	2.14	0.46
1:C:317:LEU:HB3	1:C:334:TYR:CE1	2.50	0.46
1:B:219:LYS:NZ	6:B:617:HOH:O	2.48	0.46
1:B:141:ILE:HD12	1:B:163:LEU:HD13	1.97	0.45
1:C:223:GLU:OE2	1:C:327:TYR:OH	2.29	0.45
1:C:303:GLU:OE2	1:C:306:GLY:HA2	2.16	0.45
1:C:220:LYS:HE3	1:C:327:TYR:CD1	2.51	0.45
1:C:410:LEU:O	3:C:502:8RD:N02	2.51	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:338:ASN:HB3	1:B:348:LEU:HD21	2.00	0.43
1:C:78:VAL:O	1:C:84:ARG:HD3	2.18	0.43
1:B:253:MET:HE1	1:B:310:ASP:HB2	1.99	0.43
1:B:313:SER:OG	1:B:336:PHE:HB3	2.19	0.42
1:C:143:ALA:HB1	1:C:158:ALA:HB1	2.01	0.42
1:A:187:ASN:ND2	6:A:608:HOH:O	2.37	0.42
1:A:37:PRO:HD3	1:A:51:PHE:HE2	1.84	0.42
1:C:219:LYS:HB3	6:C:809:HOH:O	2.20	0.42
1:A:258:LYS:HE3	1:A:258:LYS:HB2	1.85	0.42
1:A:224:ILE:HG21	1:A:321:ILE:HD13	2.02	0.42
1:A:298:TYR:O	1:A:313:SER:HA	2.20	0.42
1:A:118:SER:HB3	1:A:289:TRP:CZ2	2.55	0.41
1:B:269:GLY:O	1:B:273:GLU:HG3	2.20	0.41
1:A:220:LYS:HE3	1:A:327:TYR:CD1	2.55	0.41
1:B:96:VAL:HB	1:B:105:PHE:CD2	2.55	0.41
1:B:181:GLU:O	1:B:185:ARG:HG3	2.20	0.41
1:B:317:LEU:HB3	1:B:334:TYR:CE1	2.55	0.41
1:B:211:TYR:HB3	1:B:367:LEU:HD23	2.03	0.41
1:B:61:ARG:O	1:B:184:ARG:HD2	2.20	0.41
1:C:106:ASN:ND2	6:C:632:HOH:O	2.54	0.41
1:A:304:GLU:HG2	6:A:749:HOH:O	2.21	0.40
1:A:202:LEU:O	1:A:204:LYS:HA	2.21	0.40
1:C:92:THR:O	1:C:104:ARG:HD2	2.21	0.40
1:C:39:ILE:HD11	1:C:201:TYR:CE2	2.57	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:110:GLU:OE2	1:C:131:TYR:OH[4_435]	2.14	0.06

## 5.3 Torsion angles [i](#)

### 5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	385/405 (95%)	376 (98%)	9 (2%)	0	100	100
1	B	384/405 (95%)	373 (97%)	11 (3%)	0	100	100
1	C	371/405 (92%)	358 (96%)	13 (4%)	0	100	100
All	All	1140/1215 (94%)	1107 (97%)	33 (3%)	0	100	100

There are no Ramachandran outliers to report.

### 5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	345/367 (94%)	338 (98%)	7 (2%)	55	60
1	B	340/367 (93%)	335 (98%)	5 (2%)	65	71
1	C	327/367 (89%)	325 (99%)	2 (1%)	86	90
All	All	1012/1101 (92%)	998 (99%)	14 (1%)	67	73

All (14) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	39	ILE
1	A	85	SER
1	A	156	LYS
1	A	214	ARG
1	A	228	SER
1	A	231	SER
1	A	385	ASP
1	B	39	ILE
1	B	156	LYS
1	B	284	GLU
1	B	346	LYS
1	B	396	LYS
1	C	219	LYS
1	C	328	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (8) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	320	GLN
1	A	338	ASN
1	A	365	ASN
1	B	120	ASN
1	B	320	GLN
1	B	365	ASN
1	C	44	ASN
1	C	320	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

## 5.4 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

## 5.5 Carbohydrates ⓘ

There are no carbohydrates in this entry.

## 5.6 Ligand geometry ⓘ

Of 26 ligands modelled in this entry, 3 are monoatomic - leaving 23 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	$\# Z  > 2$	Counts	RMSZ	$\# Z  > 2$
5	SO4	B	508	-	4,4,4	0.12	0	6,6,6	0.09	0
5	SO4	B	507	-	4,4,4	0.15	0	6,6,6	0.12	0
5	SO4	A	509	-	4,4,4	0.13	0	6,6,6	0.06	0
2	MYA	A	501	-	54,65,65	0.84	3 (5%)	67,91,91	1.30	7 (10%)

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
3	8RD	B	502	-	36,41,41	1.40	5 (13%)	40,58,58	1.22	5 (12%)
5	SO4	A	506	-	4,4,4	0.14	0	6,6,6	0.05	0
2	MYA	C	501	-	54,65,65	0.80	2 (3%)	67,91,91	1.23	3 (4%)
5	SO4	A	507	-	4,4,4	0.14	0	6,6,6	0.11	0
5	SO4	B	506	-	4,4,4	0.15	0	6,6,6	0.12	0
5	SO4	A	504	-	4,4,4	0.13	0	6,6,6	0.10	0
5	SO4	B	504	-	4,4,4	0.16	0	6,6,6	0.12	0
5	SO4	C	507	-	4,4,4	0.17	0	6,6,6	0.12	0
5	SO4	A	508	-	4,4,4	0.16	0	6,6,6	0.11	0
5	SO4	C	504	-	4,4,4	0.15	0	6,6,6	0.23	0
5	SO4	A	505	-	4,4,4	0.14	0	6,6,6	0.26	0
5	SO4	B	505	-	4,4,4	0.15	0	6,6,6	0.10	0
5	SO4	C	505	-	4,4,4	0.17	0	6,6,6	0.09	0
5	SO4	C	506	-	4,4,4	0.14	0	6,6,6	0.07	0
5	SO4	C	508	-	4,4,4	0.12	0	6,6,6	0.25	0
3	8RD	A	502	-	36,41,41	1.53	6 (16%)	40,58,58	1.08	2 (5%)
2	MYA	B	501	-	54,65,65	0.81	2 (3%)	67,91,91	1.46	9 (13%)
3	8RD	C	502	-	36,41,41	1.44	5 (13%)	40,58,58	1.48	8 (20%)
5	SO4	A	510	-	4,4,4	0.15	0	6,6,6	0.11	0

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
3	8RD	A	502	-	-	0/14/29/29	0/5/5/5
2	MYA	B	501	-	-	4/59/80/80	0/3/3/3
2	MYA	C	501	-	-	3/59/80/80	0/3/3/3
2	MYA	A	501	-	-	3/59/80/80	0/3/3/3
3	8RD	B	502	-	-	0/14/29/29	0/5/5/5
3	8RD	C	502	-	-	0/14/29/29	0/5/5/5

All (23) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	8RD	C29-N28	-5.81	1.30	1.35
3	C	502	8RD	C29-N28	-5.32	1.31	1.35
3	B	502	8RD	C29-N28	-5.00	1.31	1.35
3	C	502	8RD	C09-C10	3.32	1.46	1.39

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	A	502	8RD	C09-C10	3.32	1.46	1.39
3	B	502	8RD	C09-C10	3.29	1.46	1.39
3	C	502	8RD	C11-C10	-3.12	1.34	1.39
2	B	501	MYA	C2-S1	-2.96	1.77	1.81
2	C	501	MYA	C2-S1	-2.85	1.77	1.81
3	A	502	8RD	N06-N05	2.65	1.42	1.37
2	A	501	MYA	C2-S1	-2.61	1.78	1.81
2	A	501	MYA	C5A-C4A	2.60	1.47	1.40
3	C	502	8RD	C07-N06	-2.60	1.30	1.33
3	B	502	8RD	N06-N05	2.57	1.42	1.37
3	B	502	8RD	C11-C10	-2.53	1.35	1.39
3	C	502	8RD	N06-N05	2.51	1.42	1.37
3	A	502	8RD	C11-C10	-2.49	1.35	1.39
3	A	502	8RD	C07-N06	-2.48	1.30	1.33
2	B	501	MYA	C5A-C4A	2.33	1.47	1.40
2	C	501	MYA	C5A-C4A	2.26	1.46	1.40
3	B	502	8RD	C07-N06	-2.26	1.30	1.33
3	A	502	8RD	C08-C07	2.23	1.44	1.40
2	A	501	MYA	C2A-N3A	2.07	1.35	1.32

All (34) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	501	MYA	O2M-C2M-C3M	5.89	119.51	109.02
2	A	501	MYA	O2M-C2M-C3M	5.56	118.92	109.02
2	C	501	MYA	O2M-C2M-C3M	5.54	118.89	109.02
2	A	501	MYA	N3A-C2A-N1A	-3.96	122.49	128.68
2	B	501	MYA	C2-C3-N4	3.67	120.13	112.42
2	B	501	MYA	N3A-C2A-N1A	-3.66	122.96	128.68
2	C	501	MYA	N3A-C2A-N1A	-3.47	123.25	128.68
3	B	502	8RD	C22-C23-C24	-3.40	124.91	127.30
2	B	501	MYA	C3-N4-C5	3.35	129.06	122.84
3	C	502	8RD	C21-O20-C19	2.89	124.76	117.69
3	C	502	8RD	C36-C37-N32	-2.89	103.70	109.84
3	C	502	8RD	C34-C33-N32	2.74	115.67	109.84
3	C	502	8RD	O35-C34-C33	2.63	117.59	111.80
2	A	501	MYA	C4M-C3M-C2M	-2.57	106.70	113.80
3	A	502	8RD	N05-C04-N12	-2.56	108.86	110.99
3	B	502	8RD	C21-O20-C19	2.53	123.88	117.69
3	C	502	8RD	N05-C04-N12	-2.51	108.90	110.99
3	B	502	8RD	N05-C04-N12	-2.47	108.93	110.99
2	B	501	MYA	C4A-C5A-N7A	-2.44	106.86	109.40

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	501	MYA	O4X-C1X-C2X	-2.34	103.51	106.93
2	B	501	MYA	C2-S1-C2M	2.33	104.58	100.16
2	A	501	MYA	C2A-N1A-C6A	2.31	122.70	118.75
2	A	501	MYA	C4A-C5A-N7A	-2.30	107.00	109.40
3	B	502	8RD	C22-C23-C29	2.29	129.97	127.48
2	B	501	MYA	P2A-O3A-P1A	-2.28	124.99	132.83
2	A	501	MYA	O8A-P3X-O7A	2.22	116.12	107.64
3	C	502	8RD	C36-O35-C34	2.19	117.20	109.89
3	A	502	8RD	C21-O20-C19	2.19	123.04	117.69
3	C	502	8RD	C37-N32-C30	2.19	129.69	122.78
3	C	502	8RD	C33-N32-C30	-2.17	115.93	122.78
2	C	501	MYA	C4A-C5A-N7A	-2.12	107.19	109.40
2	B	501	MYA	C13-C11-C10	2.08	112.43	108.82
2	B	501	MYA	C2A-N1A-C6A	2.06	122.28	118.75
3	B	502	8RD	C19-C18-C16	2.03	120.58	116.45

There are no chirality outliers.

All (10) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	A	501	MYA	S1-C2M-C3M-C4M
2	B	501	MYA	S1-C2-C3-N4
2	B	501	MYA	O5-C5-N4-C3
2	B	501	MYA	C6-C5-N4-C3
2	C	501	MYA	C12-O6A-P2A-O4A
2	C	501	MYA	S1-C2M-C3M-C4M
2	B	501	MYA	S1-C2M-C3M-C4M
2	A	501	MYA	C6-C7-N8-C9
2	A	501	MYA	P2A-O3A-P1A-O2A
2	C	501	MYA	P2A-O3A-P1A-O2A

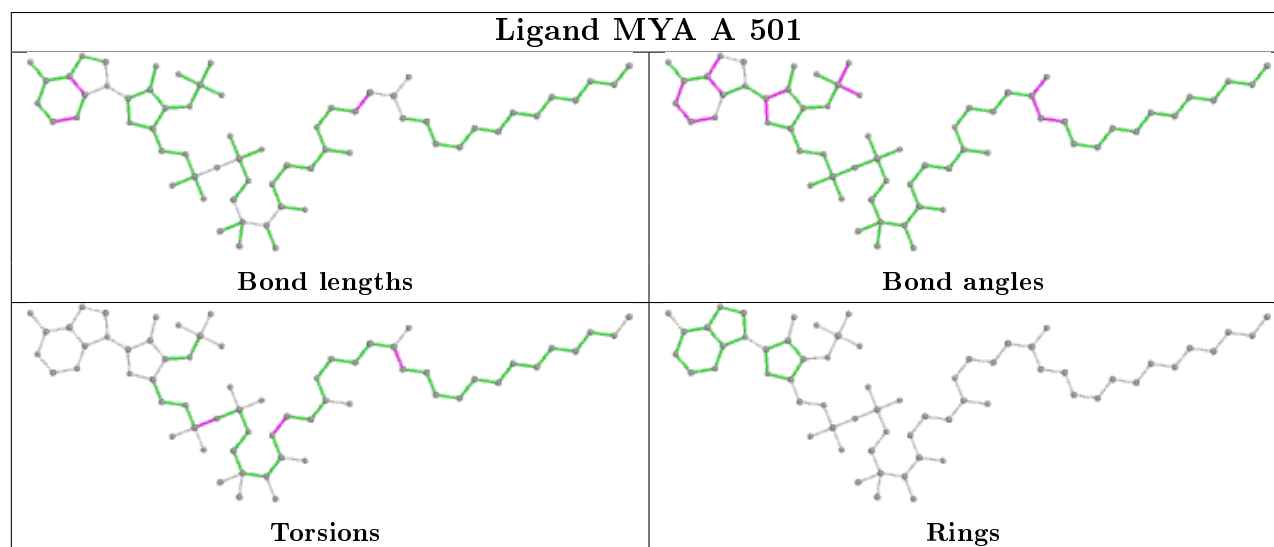
There are no ring outliers.

2 monomers are involved in 2 short contacts:

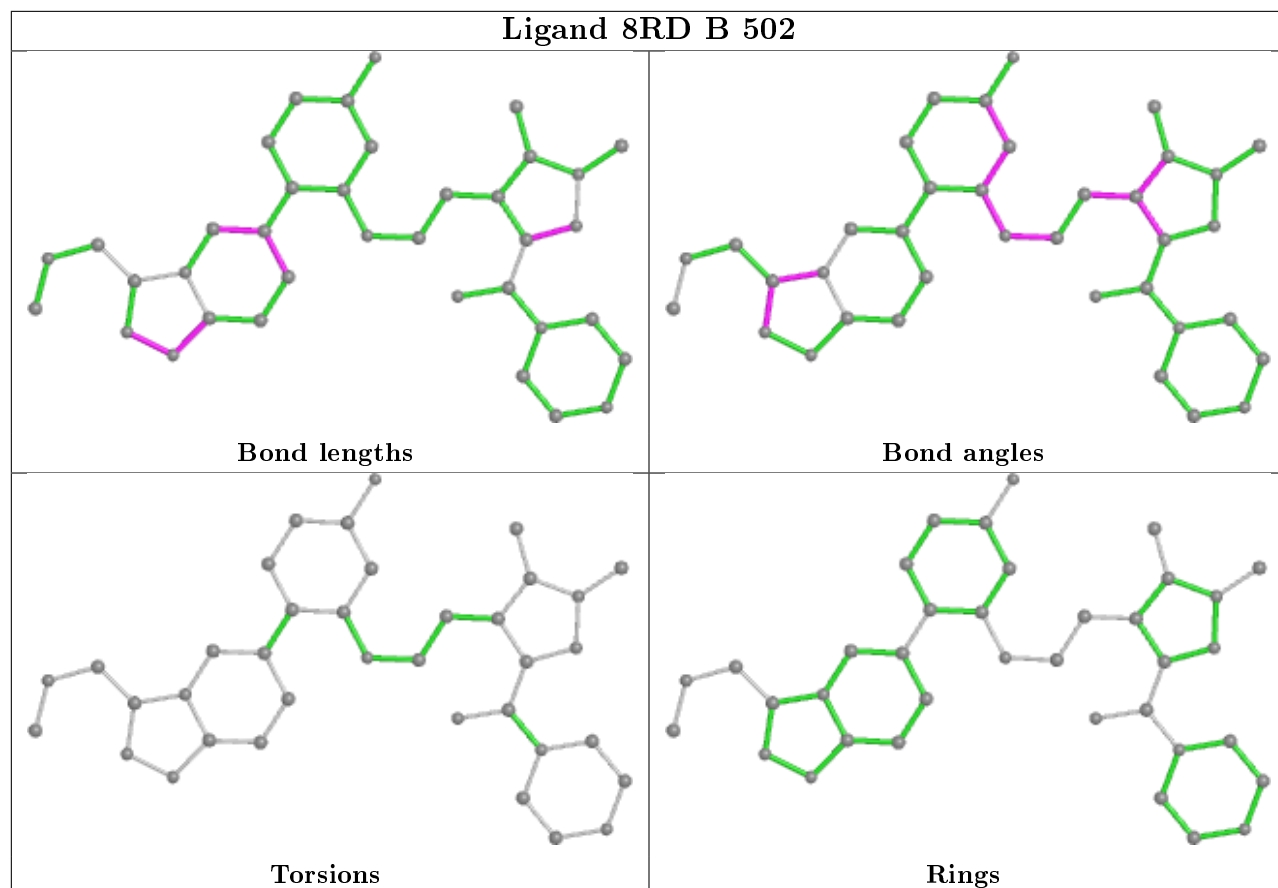
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	B	501	MYA	1	0
3	C	502	8RD	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will

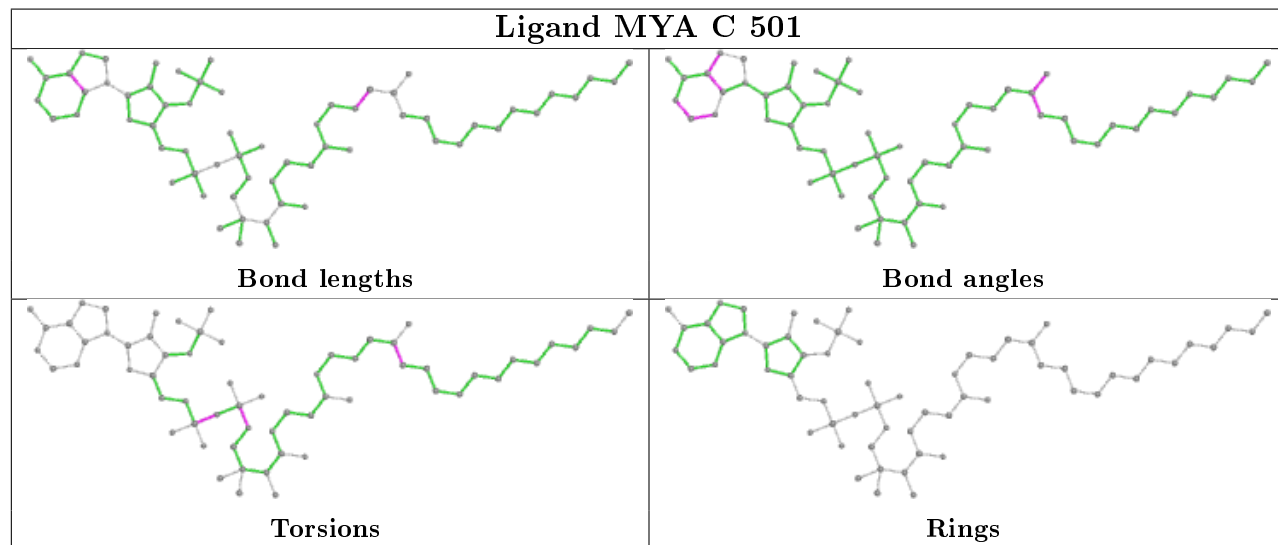
also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



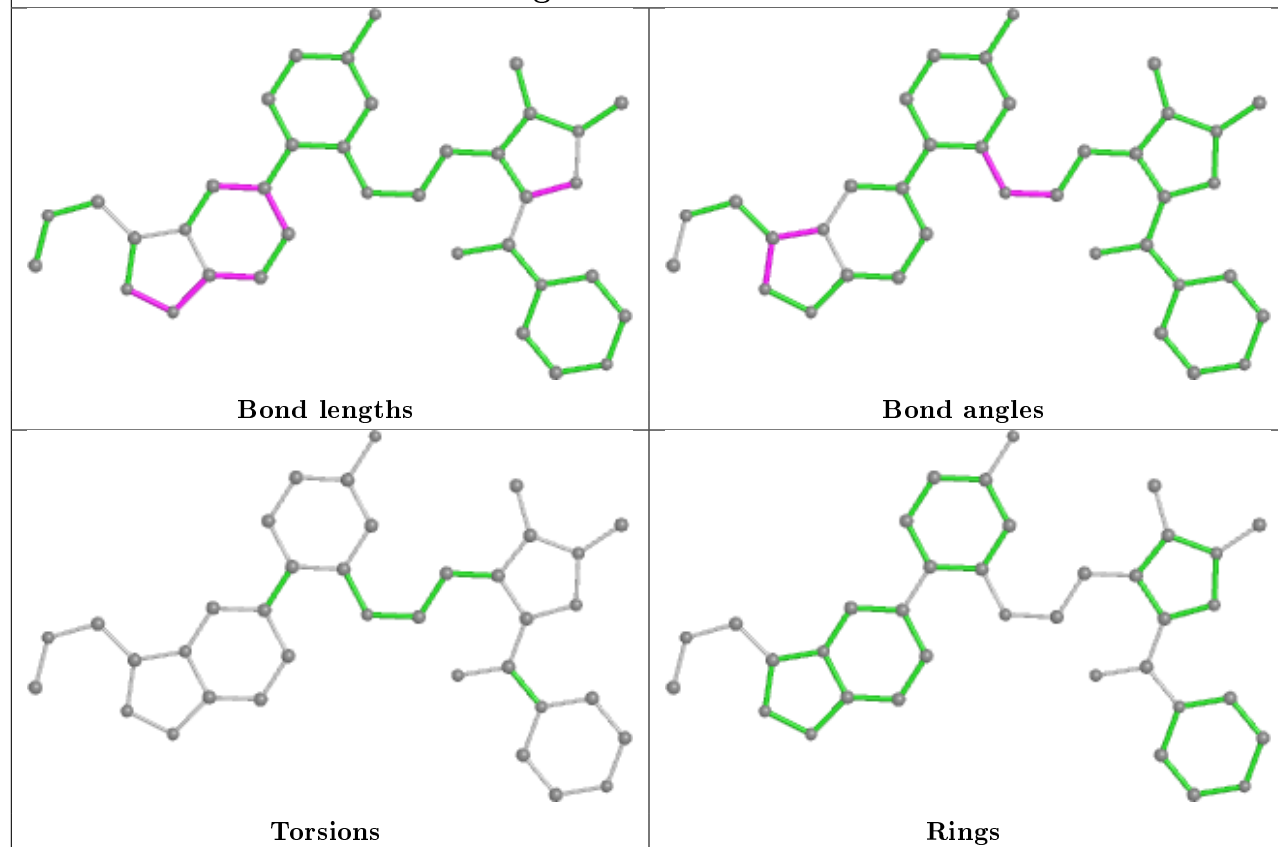
## Ligand 8RD B 502



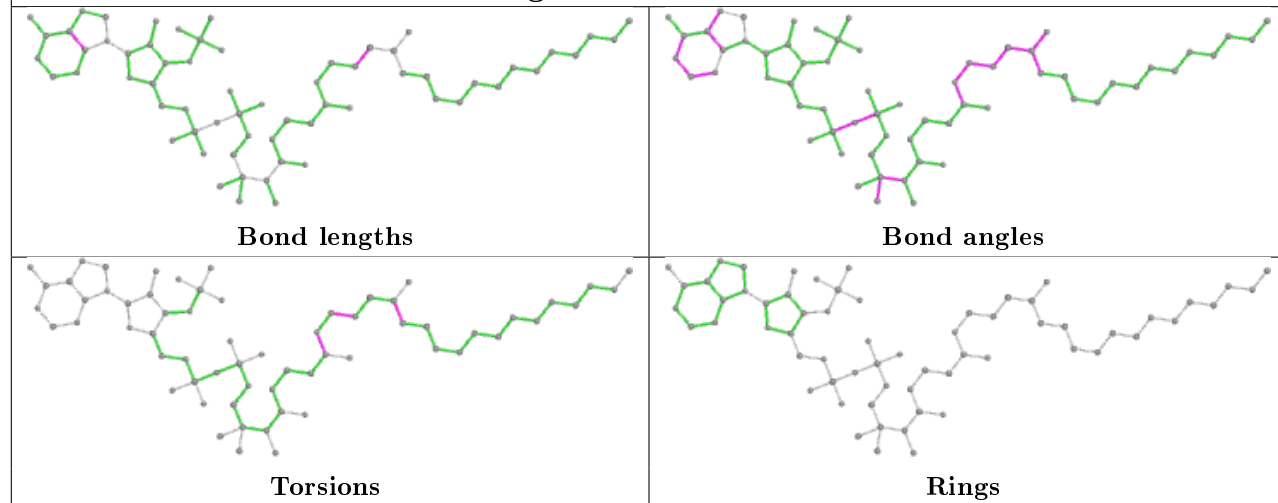
## Ligand MYA C 501

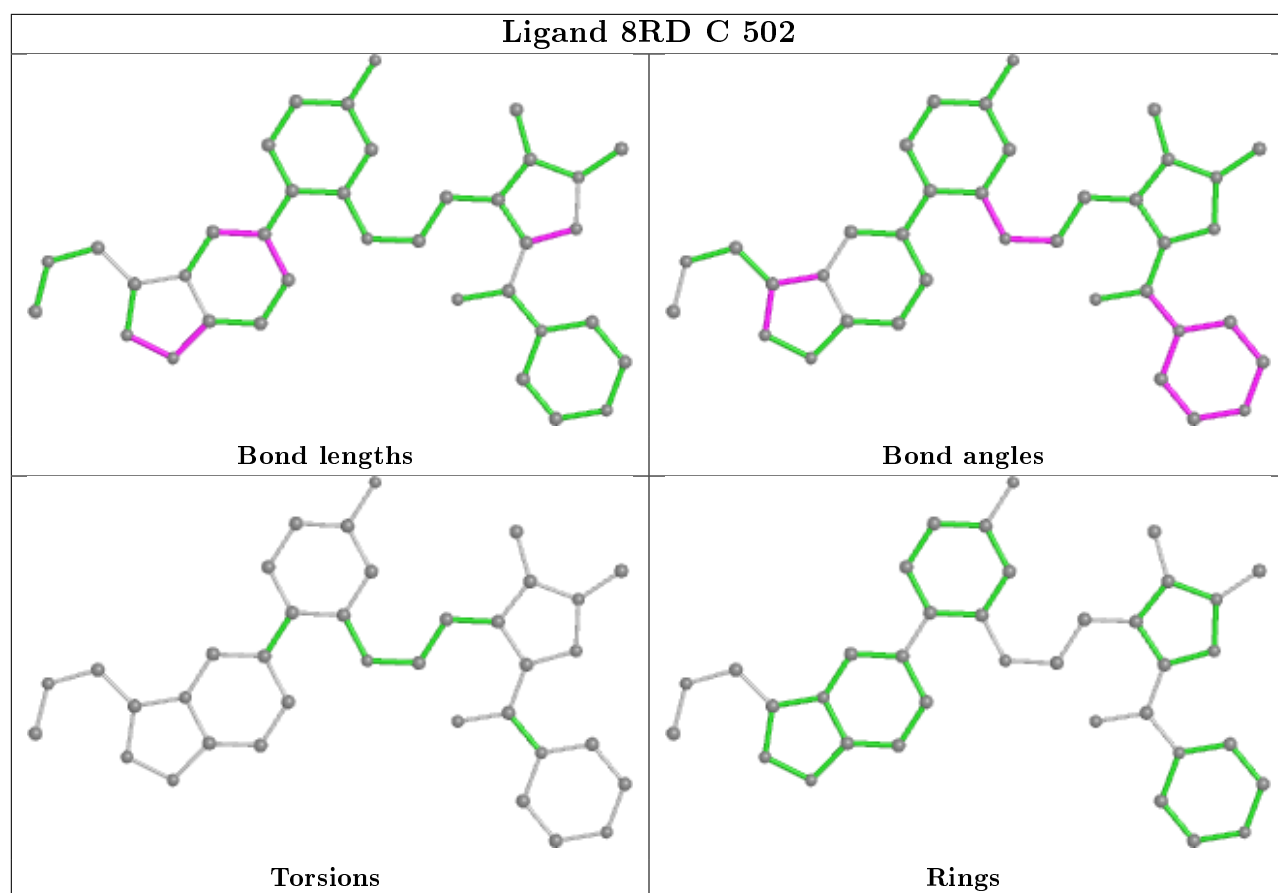


## Ligand 8RD A 502



## Ligand MYA B 501





## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ> 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q< 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2		OWAB(Å <sup>2</sup> )	Q<0.9
1	A	385/405 (95%)	-0.42	0	100   100	9, 16, 32, 57	0
1	B	385/405 (95%)	-0.36	1 (0%)	94   94	10, 18, 34, 56	0
1	C	373/405 (92%)	-0.35	2 (0%)	91   92	10, 17, 34, 55	0
All	All	1143/1215 (94%)	-0.38	3 (0%)	94   94	9, 17, 33, 57	0

All (3) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	242	TYR	3.5
1	C	239	ILE	2.5
1	B	26	PRO	2.3

### 6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

### 6.3 Carbohydrates [i](#)

There are no carbohydrates in this entry.

### 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled ‘Q< 0.9’ lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
5	SO4	C	508	5/5	0.71	0.26	50,56,58,58	5

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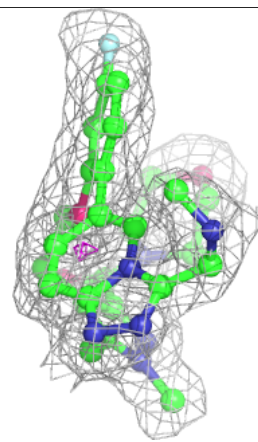
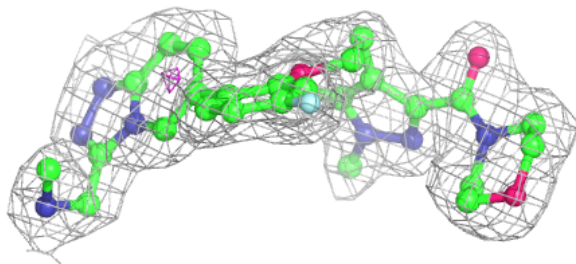
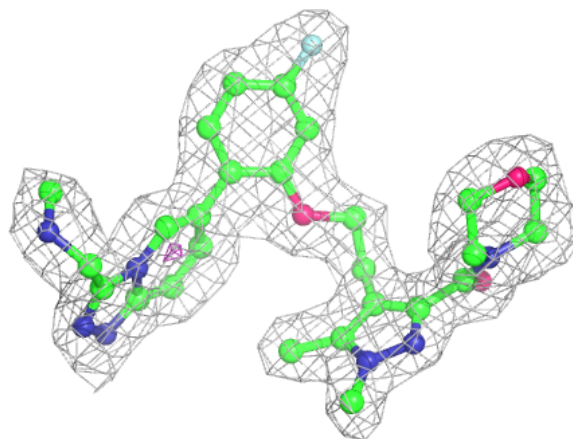
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
5	SO4	A	506	5/5	0.75	0.23	85,85,86,89	5
5	SO4	B	508	5/5	0.79	0.23	82,84,85,86	5
5	SO4	C	504	5/5	0.83	0.22	65,68,75,76	0
5	SO4	A	507	5/5	0.86	0.21	54,54,59,65	5
5	SO4	B	506	5/5	0.87	0.23	55,56,60,61	5
5	SO4	A	509	5/5	0.88	0.17	83,84,84,86	0
5	SO4	B	507	5/5	0.91	0.31	73,74,76,77	0
5	SO4	C	506	5/5	0.91	0.17	80,80,81,82	5
5	SO4	B	504	5/5	0.91	0.19	39,53,56,57	0
5	SO4	A	510	5/5	0.91	0.15	49,53,56,61	5
5	SO4	C	507	5/5	0.92	0.17	47,51,53,54	5
5	SO4	A	508	5/5	0.92	0.19	66,68,70,71	5
5	SO4	C	505	5/5	0.93	0.26	69,71,73,75	5
5	SO4	A	504	5/5	0.94	0.16	55,57,60,63	0
5	SO4	B	505	5/5	0.95	0.22	55,55,58,59	5
3	8RD	A	502	37/37	0.96	0.11	8,15,22,24	0
3	8RD	B	502	37/37	0.96	0.10	4,17,23,30	0
2	MYA	C	501	63/63	0.97	0.09	4,13,19,22	0
3	8RD	C	502	37/37	0.97	0.10	8,15,21,21	0
5	SO4	A	505	5/5	0.97	0.15	39,45,52,53	0
2	MYA	A	501	63/63	0.98	0.08	4,12,18,21	0
2	MYA	B	501	63/63	0.98	0.09	5,13,19,22	0
4	CL	A	503	1/1	0.99	0.06	13,13,13,13	0
4	CL	C	503	1/1	0.99	0.04	16,16,16,16	0
4	CL	B	503	1/1	0.99	0.04	16,16,16,16	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

**Electron density around 8RD A 502:**

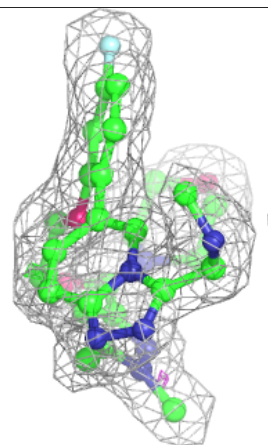
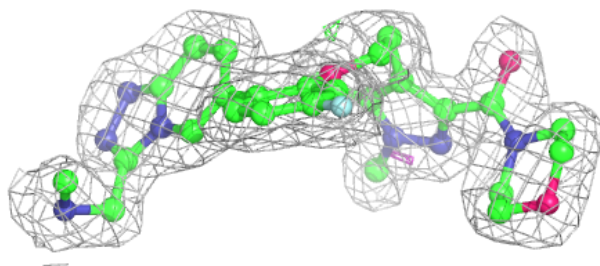
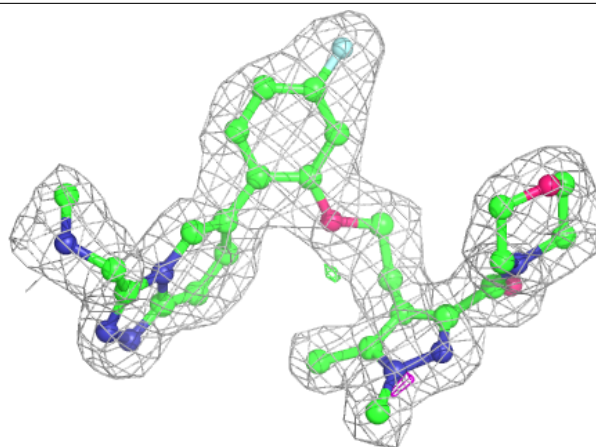
$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)





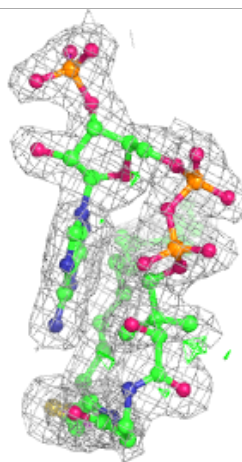
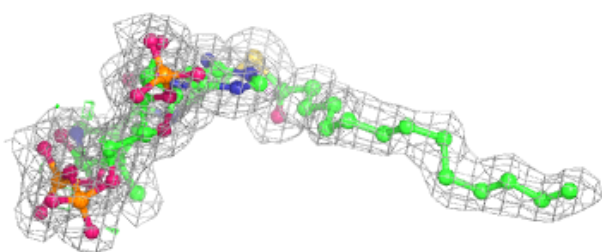
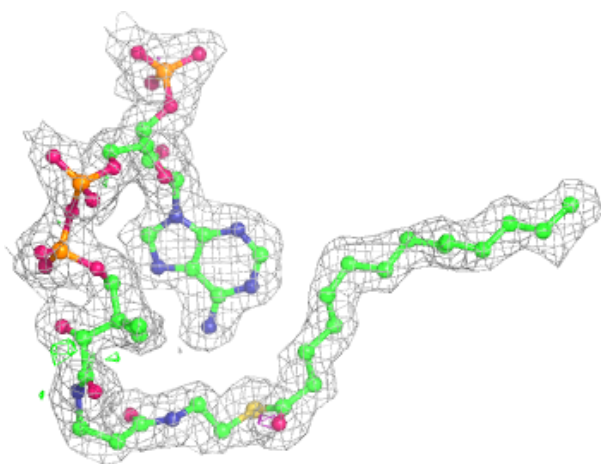
**Electron density around 8RD B 502:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



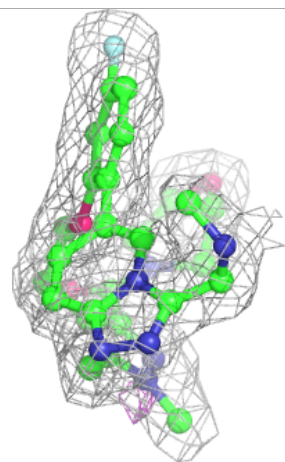
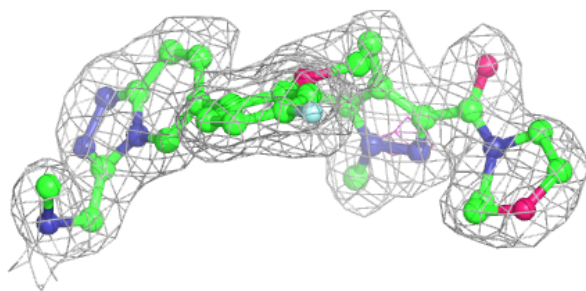
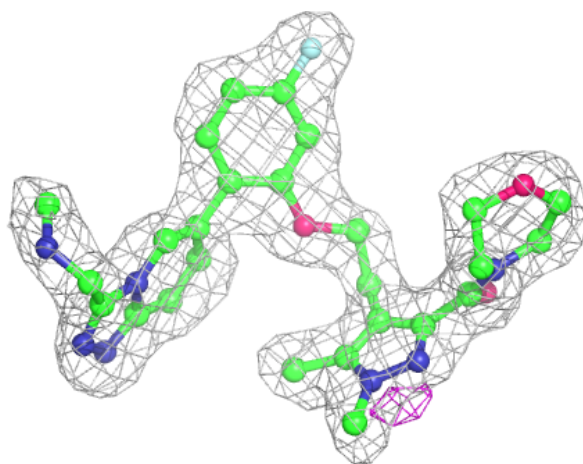
**Electron density around MYA C 501:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



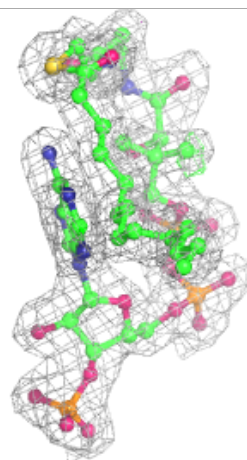
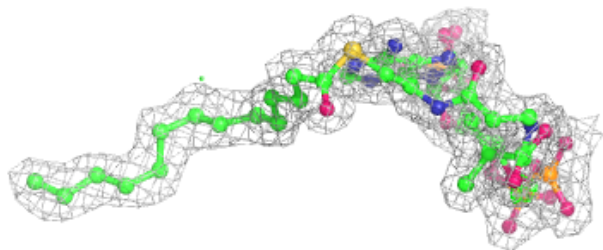
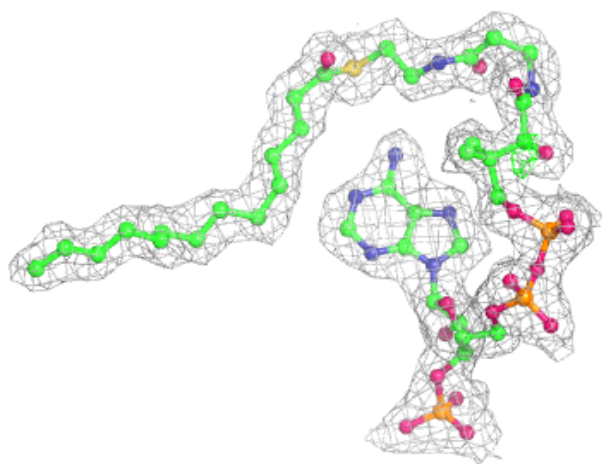
**Electron density around 8RD C 502:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



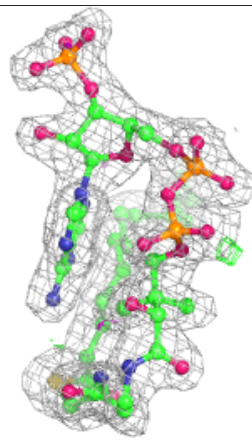
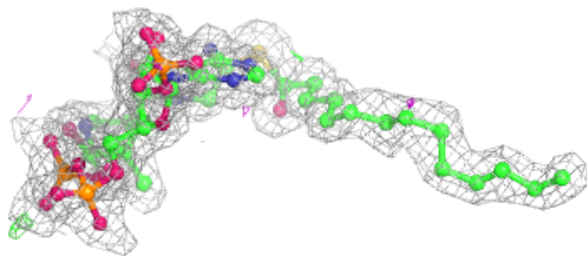
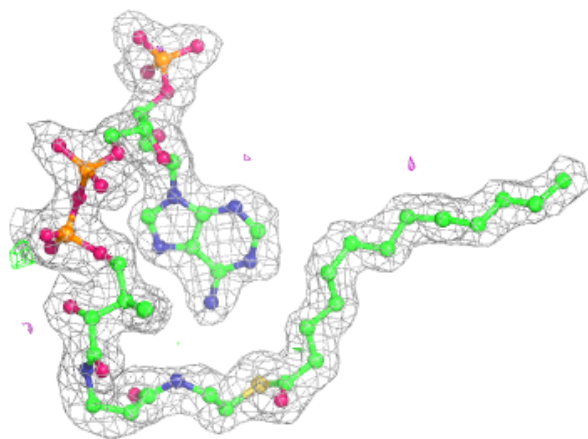
**Electron density around MYA A 501:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



**Electron density around MYA B 501:**

$2mF_o-DF_c$  (at 0.7 rmsd) in gray  
 $mF_o-DF_c$  (at 3 rmsd) in purple (negative)  
and green (positive)



## 6.5 Other polymers [i](#)

There are no such residues in this entry.